

TITLE OF INVENTION

Attachment For Releasable Pet Door Flap

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable.

BACKGROUND OF THE INVENTION

1. Field of Invention

[0001] This invention pertains to a device for allowing a pet to pass through a structural member, such as a door or a wall, while preventing environmental elements from passing through the device when the device is not in use. More particularly, this invention pertains to a device for allowing a pet ingress or egress through a structural member and for protecting the pet from detrimental entanglement with a weather-resisting door flap employed by the device.

2. Description of the Related Art

[0002] A pet door allows a pet to independently enter and exit a structure. However, the use of a pet door introduces the concern of exterior environmental elements, such as rain or wind blown particles, entering the structure through the pet door or the interior environmental elements, such as conditioned air, escaping through the pet door. This concern has prompted the design of various weather-resisting features for pet doors.

[0003] One weather-resisting feature involves the use of a two flap system to ensure a weather-tight seal between the flap and the frame. The first flap is generally

a full flap that substantially fills the opening of the pet door, such as may be found on any pet door. This flap typically includes a small amount of clearance to allow the flap to swing freely within the opening. To account for this clearance and improve the weather-resistance of the pet door, a second flap is employed. The second flap does not cover the pet door opening. Instead, it is shaped so as to follow and overlap the general contour of the opening. The center portion is open to permit passage through the second flap. By engaging both the first flap and the pet door frame, the second flap effectively produces a weather-tight seal on the pet door. Unfortunately, it has been discovered that the two-flap design described above introduces the risk of entangling animals during passage, leading to injury or death.

[0004] Conventional pet doors have addressed the entanglement issue by offering a release mechanism for the second flap. Therefore, upon the occurrence of a pet becoming entangled, the second flap releases itself from the pet door frame and relieves the pet from danger. Conventional release mechanisms include slits that are cut in the weather-resisting flap that cooperate with the pet door frame such that the flap pulls away from the frame upon the application of a force on the flap that is greater than a release force threshold.

[0005] These conventional pet doors are limited in that the slits of the weather-resisting flap yield an unpredictable release force threshold. The unpredictability of the release force threshold introduces the possibility that the release mechanism may fail when a pet is in danger or that the weather-resisting flap may be released under standard usage.

BRIEF SUMMARY OF THE INVENTION

[0006] In accordance with the present invention there is provided a pet door for providing ingress or egress, for a pet, through a structural member while offering a weather-resisting feature that prevents the ingress or egress of environmental elements while the pet door is not in use. The pet door includes two flaps that cooperate to bring about the discussed weather-resisting feature offered by the present invention. One of the flaps is a strip covering the gap between the main flap and the

frame. The strip is typically U-shaped and introduces a risk of entanglement for a pet when the two flaps assume a particular position. Because the weather-resisting feature includes a flap that introduces the potential to entangle a pet, the pet door provides a snap fastener based release mechanism for releasing the potentially injurious flap upon its entanglement with a pet. The snap fastener provides the potentially entangling flap with release mechanism that has a known release force that is repeatable and can be easily and reliably produced in large-scale manufacturing of the pet door.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0007] The above-mentioned features of the invention will become more clearly understood from the following detailed description of the invention read together with the drawings in which:

Figure 1 is an exploded view of a pet door in accordance with the present invention;

Figure 2a is a perspective view of the pet door of Figure 1 illustrating the operation of the device during ingress;

Figure 2b is a perspective view of the pet door of Figure 1 illustrating the operation of the device during egress; and

Figure 3 is a perspective view of the pet door of Figure 1 illustrating the operation of a snap fastener based release mechanism employed by the device.

DETAILED DESCRIPTION OF THE INVENTION

[0008] One embodiment of a pet door in accordance with the various features of the present invention is illustrated generally at **10** in Figure 1. The pet door **10** provides ingress or egress, for a pet, through a structural member, such as a wall, a door, or other element commonly used in construction, while offering resistance against environmental elements while the pet door **10** is not in use. Because the weather-resisting feature includes a strip that introduces the potential to entangle a pet, the pet door **10** provides a snap fastener based release mechanism for releasing

the potentially injurious strip should the pet become entangled.

[0009] Figure 1 illustrates an exploded view of the pet door **10**. In this particular embodiment, a first frame member **12** cooperates with a second frame member **14** such that when disposed on opposing faces of a structural member that contains a pre-cut opening, the first frame member **12** and the second frame member **14** define a passageway **16** that coincides with the opening. In the illustrated embodiment, the first frame member **12** includes a first female threaded port **18**, a second female threaded port **20**, a first female snap fastener portion **22**, and a second female snap fastener portion **24**, each disposed above the passageway **16**. Those skilled in the art will recognize that variations in the shape, materials, or construction of the frame or changes in the manner of installation, all of which are well known in the art, would not depart from the scope and spirit of the present invention.

[0010] The pet door **10** includes a flap **26** adapted to substantially fill the passageway **16** and to allow movement through the passageway when a force is applied to either face of the flap. The flap **26** may also be referred to as a full flap or a solid flap. Those skilled in the art will recognize that the shape of the flap **26** and the material from which the flap **26** is constructed may vary without departing from the scope and spirit of the present invention. Further, those skilled in the art will recognize that other ways of attaching the flap **26** to the first frame member **12** may be used without departing from the scope and spirit of the present invention.

[0011] The pet door **10** further includes an open flap, or strip, **38** that generally follows the perimeter of the passageway **16**. The strip **38** overlies and engages both of the flap **26** and the first frame member **12**. In the illustrated embodiment, the strip **38** includes a first male snap fastener portion **44** that is disposed at a first terminus **46** of the strip **38** and a second male snap fastener portion **48** that is disposed at a second terminus **50** of the strip **38**. The first male snap fastener portion **44** and the second male snap fastener portion **48** cooperate with the first female snap fastener portion **22** and the second female snap fastener portion **24**, respectively, such that the strip **38** attaches to the face of the first frame member **12**. When attached to the first frame member **12**, the strip **38** borders the sides and bottom of the passageway **16**.

such that an outer portion **52** of the flap engages the first frame member **12** and an inner portion **54** of the flap partially obstructs the passageway **16** and engages the flap **26**. The relative positions of the male and female parts of the snap fasteners with respect to the strip and the frame are immaterial so long as a mating relationship is maintained between the strip and the frame.

[0012] In one embodiment, the flap **26** is constructed of a flexible material secured to the frame. As illustrated in Figure 1, the flap **26** includes a first hole **28** and a second hole **30**, each disposed at the top of the flap. The flap **26** also includes a first set of magnets **32** that are disposed at the bottom of the flap **26**. The flap **26** is secured to the face of the first frame member **12** by a first screw **34** and a second screw **36** that cooperate with the first female threaded port **18** and the second female threaded port **20**, respectively. The first screw **34** is inserted into the first hole **28** and then secured to the first female threaded port **18**. Likewise, the second screw **36** is inserted into the second hole **30** and then secured to the second female threaded port **20**. The flap **26** obstructs the entire passageway **16** when in a resting position. Applying a force to either face of the flap **26** causes the flap **26** to flex and to expose the passageway **16** thereby permitting movement through the passageway **16**.

[0013] Other materials, movement mechanisms, attachment mechanisms, and arrangements for the flap and the strip are well known to those skilled in the art. For example, substantially rigid materials can be used for the flap and strip with the flap and the strip being hinged or pivotably attached to the frame. Such modifications are considered to be well within the purview of those skilled in the art and do not depart from the scope and spirit of the present invention.

[0014] When the pet door **10** is not in use, a releasable coupling provides a temporary bond between the flap **26**, the strip **38**, and the first frame member **12** to assist in the maintenance of a weather-tight seal. One type of releasable coupling often used in the field of pet doors is a magnetic coupling. The magnetic coupling is maintained between coupling components located in each of the flap **26**, the strip **38**, and the first frame member **12**. These coupling components include some combination of magnets and keepers, which are typically plates of ferromagnetic

materials. The coupling components are selected to provide a temporary bond that is selected to be broken when a threshold force is applied to the flap **26**, for example, when a pet attempts to pass through the pet door **10**.

[0015] In the illustrated embodiment, the flap **26** includes a first set of magnets **32** that are disposed at the bottom of the flap **26** and the strip **38** includes a second set of magnets **40** and a third set of magnets **42**, which are disposed at the closed-end of the strip **38**. The second set of magnets **40** magnetically bonds the strip **38** to the first frame member **12**. The third set of magnets **42** magnetically bond with the first set of magnets **32** such that the flap **26** is held in contact with the inner portion **54** of the strip **38**. When the aforementioned magnetic bonds are present, the pet door **10** is employing the discussed weather-resisting feature that deters the ingress or egress of environmental elements.

[0016] Figure 2a illustrates the operation of the pet door **10** during the ingress of a pet. Ingression is defined as the passing through the passageway **16** by entering at the second frame member **14** and exiting at the first frame member **12**. As a pet applies force to the flap **26** during ingress, the flap **26** applies force to the inner portion **54** of the strip **38**, causing the magnetic bond produced by the second set of magnets **40** and the first frame member **12** to be broken. The third set of magnets **42** and the first set of magnets **32** maintain the magnetic bond that secures the flap **26** to the strip **38**, causing the flap **26** and the strip **38** to act as one flap that pivots and flexes in the direction of the applied force, allowing the pet passage. When the pet has cleared the passageway **16**, the flaps fall to their original position and the second set of magnets **40** reassumes a magnetic bond with the first frame member **12**.

[0017] Figure 2b illustrates the operation of the pet door **10** during the egression of a pet. Egression is defined as the passing through the passageway **16** by entering at the first frame member **12** and exiting at the second frame member **14**. As a pet applies force to the flap **26** during egress, the magnetic bond produced by the third set of magnets **42** and the first set of magnets **32** is broken because the strip **38**, due to its restricting contact with the first frame member **12**, is unable to pivot in the direction of the applied force. Therefore, the flap **26** pivots and flexes in the direction

of the applied force, allowing the pet passage. When the pet has cleared the passageway **16**, the flap **26** falls to its original position and the third set of magnets **42** reassumes a magnetic bond with the first set of magnets **32**.

[0018] Figure 3 illustrates the operation of the release mechanism employed by the pet door **10**. As discussed, the flap **26** becomes disengaged from the strip **38** due to various forces. When this condition occurs, the risk of a pet becoming entangled with the strip **38** is introduced. When a pet is entangled with the strip **38**, it is necessary that the strip **38** be released from the first frame member **12** of the pet door **10** in order to relieve the pet from danger. Because the strip **38** is attached to the first frame member **12** by snap fasteners, the pressure from a struggling pet on the strip **38** unbinds the snap fasteners such that the strip **38** is free from the first frame member **12** and the pet is free from danger.

[0019] Because the snap fasteners employed in the present invention are uniformly produced, they offer a consistent release force. This release force is calibrated to accommodate the needs of the pet door **10**. As a result, the possibility that the release mechanism may fail when a pet is in danger or that the strip **38** may be released under standard usage is eliminated.

[0020] From the foregoing description, those skilled in the art will recognize that a device for providing ingress and egress through a structural member offering advantages over the prior art has been provided. The device provides a weather-resisting feature that prevents the passing of environmental elements through the pet door. The device further provides a release mechanism for reliably releasing a potentially entangling flap. The release mechanism is easily mass produced while still providing a known, uniform, and repeatable release condition.

[0021] While the present invention has been illustrated by description of several embodiments and while the illustrative embodiments have been described in considerable detail, it is not the intention of the applicant to restrict or in any way limit the scope of the appended claims to such detail. Additional advantages and modifications will readily appear to those skilled in the art. The invention in its

broader aspects is therefore not limited to the specific details, representative apparatus and methods, and illustrative examples shown and described. Accordingly, departures may be made from such details without departing from the spirit or scope of applicant's general inventive concept.